

WHAT IS CLAIMED IS:

1. An image forming apparatus comprising:

an endless belt configured to be rotatably driven;

a plurality of image carriers disposed in a moving  
5 direction of the endless belt;

a plurality of charging units provided for each of the  
plurality of image carriers respectively and configured to  
uniformly charge a surface of each of the image carrier;

an exposing unit configured to expose the plurality of  
10 image carriers charged by the charging unit to form an  
electrostatic latent image on the plurality of image carriers;  
and

a plurality of developing units provided for each of the  
plurality of image carriers respectively and configured to  
15 develop the electrostatic latent image on each of the image  
carrier with a developer of different color to form a developer  
image and to retrieve a residual developer on the image carrier,

wherein the endless belt is configured to be transferred  
the developer images formed on each of the plurality of image  
20 carriers thereon to form a color image, and transfers the color  
image onto a recording medium, and

wherein the developing unit provided at a most upstream  
position with respect to the moving direction of the endless belt  
forms the developer image with a developer of black color, and  
25 is configured to retrieve a residual developer on the endless

belt.

2. The image forming apparatus as claimed in claim 1, wherein the developing unit provided at the most upstream position retrieves the residual developer on the endless belt by electrically moving the residual developer.

3. The image forming apparatus as claimed in claim 1 further comprising a developer charging unit that charges the developer on the endless belt in a reverse polarity to a charging polarity of the developer.

4. The image forming apparatus as claimed in claim 3, wherein the image forming apparatus operates in a plurality of modes in which including:

a normal mode in which the developer on the endless belt is charged by the developer charging unit and electrically moved to the image carrier provided on the most upstream in a state where the image carrier provided on the most upstream is exposed to light by the exposing unit; and

a cleaning mode in which the developer on the endless belt is charged by the developer charging unit and electrically moved to the image carrier provided on the most upstream in a state where the image carrier provided on the most upstream is not exposed to light by the exposing unit.

5. The image forming apparatus as claimed in claim 1 further comprising a retrieval restoring unit that temporarily retrieves the developer on the endless belt and restoring the retrieved

developer onto the endless belt.

6. The image forming apparatus as claimed in claim 5 further comprising a bias generating unit that applies a bias generating a potential difference to move the developer on the endless belt  
5 to the image carrier.

7. The image forming apparatus as claimed in claim 1, wherein the charging unit is disposed to be in non-contact with the image carrier.

8. The image forming apparatus as claimed in claim 1, wherein  
10 the developing unit is configured to be separable from the image carrier and detachable with the image forming apparatus.

9. The image forming apparatus as claimed in claim 1, wherein the developing unit comprises a developer carrier disposed to be in contact with the image carrier and carries the developer  
15 for forming the developer image by developing an electrostatic image on the image carrier, and

wherein the developer carrier is configured to retrieve the residual developer on the image carrier.

10. The image forming apparatus as claimed in claim 9, wherein  
20 the developing unit comprises a developer supplying unit disposed to be in contact with the developer carrier and supplies the developer onto the developer carrier while charging the developer, and

wherein the developer of black color is configured to be  
25 more chargeable than other developers of other colors.

11. The image forming apparatus as claimed in claim 1, wherein the developing unit employs a polymerized toner as the developer.

12. An image forming apparatus comprising:

an endless belt configured to be rotatably driven and  
5 conveys a recording medium;

a plurality of image carriers disposed in a moving direction of the endless belt;

a plurality of charging units provided for each of the plurality of image carriers respectively and configured to  
10 uniformly charge a surface of each of the image carrier;

an exposing unit configured to expose the plurality of image carriers charged by the charging unit to form an electrostatic latent image on the plurality of image carriers;  
and

15 a plurality of developing units provided for each of the plurality of image carriers respectively and configured to develop the electrostatic latent image on each of the image carrier with a developer of different color to form a developer image and to retrieve a residual developer on the image carrier,

20 wherein each of the plurality of image carriers transfer the developer images on the recording medium to form a color image,  
and

wherein the developing unit provided at a most upstream position with respect to the moving direction of the endless belt  
25 forms the developer image with a developer of black color, and

is configured to retrieve a developer adhered on the endless belt.

13. The image forming apparatus as claimed in claim 12, wherein the developing unit provided at the most upstream position retrieves the developer on the endless belt by electrically  
5 moving the residual developer.

14. The image forming apparatus as claimed in claim 12 further comprising a developer charging unit that charges the developer on the endless belt in a reverse polarity to a charging polarity of the developer.

10 15. The image forming apparatus as claimed in claim 14, wherein the image forming apparatus operates in a plurality of modes in which including:

a normal mode in which the developer on the endless belt is charged by the developer charging unit and electrically moved  
15 to the image carrier provided on the most upstream in a state where the image carrier provided on the most upstream is exposed to light by the exposing unit; and

a cleaning mode in which the developer on the endless belt is charged by the developer charging unit and electrically moved  
20 to the image carrier provided on the most upstream in a state where the image carrier provided on the most upstream is not exposed to light by the exposing unit.

16. The image forming apparatus as claimed in claim 12, wherein the charging unit is disposed to be in non-contact with the image  
25 carrier.

17. The image forming apparatus as claimed in claim 12, wherein the developing unit is configured to be separable from the image carrier and detachable with the image forming apparatus.

18. The image forming apparatus as claimed in claim 12, wherein  
5 the developing unit comprises a developer carrier disposed to be in contact with the image carrier and carries the developer for forming the developer image by developing an electrostatic image on the image carrier, and

wherein the developer carrier is configured to retrieve  
10 the residual developer on the image carrier.

19. The image forming apparatus as claimed in claim 18, wherein the developing unit comprises a developer supplying unit disposed to be in contact with the developer carrier and supplies the developer onto the developer carrier while charging the  
15 developer, and

wherein the developer of black color is configured to be more chargeable than other developers of other colors.

20. The image forming apparatus as claimed in claim 12, wherein the developing unit employs a polymerized toner as the developer.

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